REMARKS

Objection to the Drawings

The drawings have been objected to under 37 CFR 1.83(a) as not showing the limitation of "a plurality". This objection is traversed, as all of the features having the limitation "a plurality" in the claims are shown in the drawings in a plural format.

The elements that include the limitation "a plurality" are the die contacts 62 (Figure 2B), the conductors 66 (Figure 2B), the first contacts (bumped contacts 58-Figure 2B), and the second contacts (test contacts 60-Figure 2B).

Figure 2B is a cross section taken along section line 2B-2B of Figure 2A. In Figure 2A, the first contacts (bumped contacts 58) and the second contacts (test contacts 60) are shown in plural form. Each first contact (bumped contact 58) and each second contact (test contact 60) has an associated conductor 66 and die contact 62. In addition, the specification refers to all of these elements in the plural. It is thus submitted that the drawings show the claimed features in the plural form, and this would be apparent to one skilled in the art.

Rejections Under 35 USC §102 and 35 USC §103

Claims 47-67 have been rejected under 35 USC §102(b) as being anticipated by Gilleo et al. (US Patent No. 6,204,455 B1).

Claims 47-67 have been rejected under 35 USC §102(b) as being anticipated by Sumi et al. (US Patent No. 5,767,528).

The rejections under 35 USC §102(b) are traversed for the reasons to follow.

Summary of the Invention

The rejected claims are directed to a semiconductor component. As shown in Figure 2B, the component 50 includes a semiconductor die 54 having die contacts 62, such as bond pads, and an electrically insulating die passivation layer 76. The component 50 also includes a plurality of redistribution conductors 66 on the die passivation layer 76 configured to redistribute the pattern of the die contacts 62 into an area array, such as a grid array. In addition, the redistribution conductors 66 can either "fan out" or "fan in" the pattern of the die contact 62.

The component 50 also includes an electrically insulating outer passivation layer 78 having openings 82 aligned with selected portions of the conductors 76. The openings 82, and the selected portions of the conductors 76, are arranged in the area array provided by the redistribution conductors 66. The component 50 also includes a plurality of bumped contacts 58 (first contacts) in the openings 82 in the outer passivation layer 78 bonded to the selected portions of the redistribution conductors 66.

The component 50 can also include test contacts 60 (second contacts) comprising selected portions of the redistribution conductors 66 aligned with second openings 80 in the outer passivation layer 78. In addition, the test contacts 60 (second contacts) can also include conductive pads 94 (Figure 3C) made of a non oxidizing metal, such as Au or Pt. The component 50 can also include under bump metallization layers 44 (Figure 1B) configured

to facilitate bonding of the bumped contacts 58 (first contacts) to the redistribution conductors 66.

35 USC §102 Rejections Over Gilleo et al.

The 35 USC §102 rejections over Gilleo et al. are traversed as this reference does not disclose all of the elements of the present components. A proper 35 USC §102 rejection requires that each and every element of the claimed invention be disclosed in a single prior art reference. In addition, the reference must be enabling and describe the applicant's claimed invention sufficiently to have placed it in possession of a person of ordinary skill in the field of the invention. In re David C. Paulsen, 30 F.3d 1475, 31 USPQ 2d (BNA) 1671, (U.S. App 1994).

The presently claimed redistribution conductors 66 (Figure 2B) are not disclosed by Gilleo et al. In the present component the redistribution conductors 66 are configured to redistribute the pattern of the die contacts 62 (Figure 2B) to that of the bumped contacts 58 (first contacts). In Gilleo et al. the die contacts 44 have the exact same pattern as the conductive elements 26 on the connection component 22 (column 6, lines 32-35 of Gilleo et al.). In addition, the present component includes test contacts 60 (second contacts) that are separate elements than the bumped contacts 58 (first contacts). In Gilleo et al., if the conductive elements 26 are equivalent to the present test contacts 60 (second contacts), there are no separate bumped contacts 58 (first contacts). Independent claims 47, 54, 58 and 63 all include recitation on the redistribution conductors, and the feature of the bumped contacts 58 (first contacts) and the test contacts 60

(second contacts) being separate elements with different patterns.

Gilleo et al. also does not disclose the presently claimed insulating layer (die passivation layer 76) between the die and the conductors. In this regard Figure 2 of Gilleo was cited as showing the insulating layer element. However, Applicant is unable to locate an insulating layer between redistribution conductors and the die 42.

35 USC §102 Rejections Over Sumi et al.

The 35 USC §102 rejections over Sumi et al. are also traversed because the reference does not disclose all of the elements of the present components. In particular, Sumi et al. does not disclose redistribution conductors 66 configured to redistribute a pattern of the die contacts 62 (Figure 2B). In Sumi et al. the die (semiconductor element 11) is mounted to a wiring board 12, and the conductors (leads 18) are on the wiring board 12, rather than on the die (semiconductor element 11) as presently claimed. In order to emphasize this difference independent claims 47, 54, 58 and 63 have been amended to state the die contacts and the redistribution conductors are on the face (circuit side) of the die. In addition, the amended independent claims state that the first contacts (bumped contacts 58) are on the face of the die. The claimed construction provides a chip scale component because all of the elements are within the footprint of the die. In Sumi et al. the device 10 has a larger footprint than the die (semiconductor element 11) because the first contacts (electrodes 14) and the second contacts (pad portions 18) are outside of the footprint of the die.

In addition to this difference, independent claim 47 has been amended to state the second contacts (test contacts 60) are "on" the die contacts 62. Independent claim 54 has been amended to state that the second contacts (test contacts 60) are "aligned with" the die contacts 62. Antecedent basis for these recitations is contained on page 7, lines 12-13 of the specification. With this construction the second contacts (test contacts 60) and the die contacts 62 have the same pattern. This permits the component to be tested using an interconnect that is also configured to test the bare die (page 7, lines 14-15 of the specification). Independent claim 54 also recites an insulating layer with openings, and that the second contacts comprise pads in the openings. The insulating layer and openings facilitate manufacture of the second contacts.

Amended independent claim 58 states the second contacts comprise "non-oxidizing layers on portions of the conductors". This construction helps to provide low resistance electrical connections between the test contacts and the test probes. In Sumi et al. the leads 18 and pad portions 22 comprise copper foil (column 8, lines 15-17). One problem with copper is that it oxidizes such that contact resistance between the pads portions 22 and the test probe would increase.

Amended independent claim 63 recites "bumped contacts on the face comprising under bump metallization layers on the conductors" and "test contacts on the face comprising non oxidizing layers on the conductors". Although both under bump metallization layers and non oxidizing layers are known in the art, these features are on redistribution conductors having both bumped contacts and terminal

contacts. It is submitted that claim 63 "taken as a whole" with these features in combination, is both novel and unobvious over the prior art.

Conclusion

In view of the amendments and arguments, favorable consideration and allowance of claims 47-67 is requested. An Information Disclosure Statement is being filed concurrently with this Amendment. Should any issues remain, the Examiner is requested to contact the undersigned by telephone.

DATED this 17th day of September, 2004.

Respectfully submitted:

Stephen A. Gratton
Registration No. 28,418
Attorney for Applicant

2764 South Braun Way
Lakewood, CO 80228
Telephone: (303) 989 6353
Fax: (303) 989 6538

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September 17, 2004
Date of Signature

Stephen A. Gratton, Attorney for Applicant